UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
2002/00082

September 18, 2002

Mr. Fred Patron
U.S. Department of Transportation
Federal Highway Administration
The Equitable Center, Suite 100
530 Center Street NE
Salem, OR 97301

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Act Essential Fish Habitat Consultation on the Effects of a Bridge Construction Project on Bear Creek, McKenzie River, Lane County, Oregon, (Key No. # 11510).

Dear Mr. Patron:

Enclosed is a biological opinion (Opinion) prepared by the National Marine Fisheries Service (NOAA Fisheries) for the proposed Bear Creek Bridge Replacement Project in Lane County, Oregon. Federal Highway Administration (FHWA) funds would partially finance this project and constitute the Federal nexus. The Oregon Department of Transportation (ODOT) is responsible for the project design and management.

This Opinion considers the potential effects of the project on Upper Willamette River (UWR) chinook salmon (*Oncorhynchus tshawytscha)* and UWR steelhead (*O. mykiss*) which occur in the proposed project area. NOAA Fisheries concludes that the proposed action is not likely to jeopardize the ESA-listed species. Pursuant to section 7 of the Endangered Species Act (ESA), NOAA Fisheries has included reasonable and prudent measures with non-discretionary terms and conditions that NOAA fisheries believes are necessary and appropriate to minimize the potential for incidental take associated with this project.

This Opinion also serves as consultation on essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and implementing regulations at 50 CFR Part 600. NOAA Fisheries concluded that the proposed action may adversely affect designated EFH for chinook salmon. As required by section 305(b)(4)(A) of the MSA, included are conservation recommendations that NOAA Fisheries believes will avoid, minimize, mitigate or otherwise offset adverse effects on EFH resulting from the proposed action. As described in the enclosed consultation, 305(b)(4)(B) of the MSA requires that a Federal action agency must provide a detailed response within 30 days of receiving an EFH conservation recommendation.

Questions regarding this letter should be directed to Tom Loynes of my staff in the Oregon State Branch Office at (503) 231-6892.

Sincerely,

for D. Robert Lohn
Regional Administrator

cc: Molly Cary, ODOT
Greg Apke, ODOT
Nick Testa, ODOT
Brian Bauman, ODOT
Ken Franklin, ODOT
Randy Reeve, ODFW
Zak Toledo, Mason, Bruce and Girard, Inc.

Endangered Species Act - Section 7 Consultation
&
Magnuson-Stevens Act
Essential Fish Habitat Consultation

BIOLOGICAL OPINION

Bear Creek Bridge (Fish Passage) Project
McKenzie Highway,
Lane County, Oregon

Agency: Federal Highway Administration

Consultation
Conducted By: NOAA Fisheries,
Northwest Region

Date Issued: September 18, 2002

Issued by:

for D. Robert Lohn
Regional Administrator

Refer to: **2002-00082**

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1. ENDANGERED SPECIES ACT

1.1 Background

On February 7, 2002, the National Marine Fisheries Service (NOAA Fisheries) received a request from the Federal Highway Administration (FHWA) for Endangered Species Act (ESA) section 7 formal consultation for the Bear Creek Bridge Replacement Project. During review, NOAA Fisheries determined that additional design information was needed to complete consultation. On April 19, 2002, this information was requested, and on May 16, 2002, Oregon Department of Transportation (ODOT) Geo-Hydro staff met with NOAA Fisheries engineers to discuss specific design criteria. On August 29, 2002, NOAA Fisheries received the final designs for the fish passage project and resumed consultation.

After review by NOAA Fisheries engineers, NOAA Fisheries requested that ODOT submit a new design that eliminated much of the large riprap within the channel and used the NOAA Fisheries "sills guidance" and the Washington Department of Fish and Wildlife (WDFW) (September 22, 2001) *Fish Passage Design at Road Culverts* as further guidance. ODOT submitted a new design that included this "sill" concept.

The project would involve the improvement of fish passage in Bear Creek by replacing a concrete box culvert with a single-span bridge near Vida, Oregon. The proposed structure is an approximately 14 meters (m) long, single-span, two-lane bridge supported on steel piles. FHWA funds would partially finance this project and constitute the Federal nexus. ODOT is responsible for the project design and management. NOAA Fisheries engineers approved the new design with a modification to allow some jump depth below each weir.

Bear Creek is a tributary of the McKenzie River, which flows into the Willamette River. The project site is located at the McKenzie Highway (Highway 126) crossing of Bear Creek, approximately 10 kilometers (km) east of Vida in Lane County. The project site is approximately 50 m upstream of the confluence with the McKenzie River, at river km (RKm) 75.6. The FHWA is proposing to replace a 3 by 3 by 13 m-long concrete box culvert with a 14 m-long, single-span, two-lane bridge.

The FHWA determined that the proposed action is likely to adversely affect the Upper Willamette River (UWR) chinook salmon (*Oncorhynchus tshawytscha)* and UWR steelhead (*O. mykiss*), which are present in the project area. The effects determination was made using the methods described in *Making ESA Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NOAA Fisheries 1996). The UWR steelhead was listed as threatened under the Endangered Species Act (ESA) by NOAA Fisheries on March 25, 1999 (64 FR 14517). The UWR chinook salmon was listed as threatened under the ESA on March 24, 1999 (64 FR 14308).
This biological opinion (Opinion) is based on the information presented in the biological assessment (BA) and the result of the consultation process.

The objective of this Opinion is to determine whether the proposed action to stabilize the stream bank with riprap and construction of a bridge is likely to jeopardize the continued existence of the UWR chinook salmon or UWR steelhead.

1.2 Proposed Actions

1.2.1 Box Culvert Demolition

The purpose of the box culvert removal is to re-establish adult and juvenile fish passage through the project area. This will open up approximately 1 kilometer (km) of spawning and rearing habitat. The asphalt/concrete-wearing surface and associated fill material would be removed from the structure using containment measures to prevent debris from entering the stream. The removed debris would not be placed near or in any wetland or waterway. Streamflow would be diverted from the work area while the concrete box culvert is removed. When the streamflow is diverted from the work area, construction equipment would operate in the channel. Upstream fish passage would not be provided during water diversion activities, however, upstream fish passage currently does not exist due to low-flow conditions at the proposed time of construction.

1.2.2 Bridge Construction

A single-span, 14 m, two-lane bridge would be constructed at the project location. The beams for the bridge would be supported on steel piles. The proposed bridge would be 13 m wide, with 1.6 m shoulders. Cast-in-place wingwalls and bridge abutments would be included in the project.

The proposed bridge would be constructed in stages. Geotechnical analysis indicates that the two abutments would require steel piles. The steel piles would be driven outside of the riparian area. Cast-in-place pile caps would be poured on the steel piles. Containment measures would be implemented to ensure no concrete or construction materials entered the stream.

Pre-cast and pre-stressed bulb I-beams would be placed directly on the end bents. Forms would be constructed on the superstructure and the concrete wearing surface/decking would be poured. The roadway asphalt would be laid to match the elevation of the bridge deck.

There would be an increase in impervious surface area due to the widening of the new bridge above that of existing conditions. The impervious surface area would increase from 122 m^2 to 182 m^2, for a total addition of 60 m^2. The bridge approach roadway would also be slightly widened to taper to the proposed bridge width. The bridge curbs and rails would be installed on the bridge margin. The curbs would divert flow along the edge of the bridge and off the end. The chemically-contaminated stormwater runoff would be forced off the edges of the roadway and then filtered via bio-geo-chemical processes over vegetated ground prior to entering Bear Creek. Presently, the water flows off the impervious surface directly over the bank and is not curbed to allow infiltration through vegetation.

The proposed project would remove four small clusters of 15 to 20 cm dbh bigleaf maple trees. Each cluster provides approximately 10 m^2 of crown cover. Other vegetation impacts would be minimal and related to minor limbing and clearing. Removal of riparian vegetation would be limited to the areas immediately adjacent (~ 5 m) to the proposed bridge, and within the new overhead utility line corridor.

1.2.3 Work Area Isolation

To de-water the work area, the contractor will use a gravity feed isolation method. The work area would be isolated by constructing two temporary dams on the upstream and downstream ends of the action area to enclose the area, which will de-water the work area. A 760 millimeter (mm) corrugated polyethylene pipe will transfer the water through the action area as a bypass. On the upstream end there will be a primary and a secondary dam. The area between the dams is designed to capture seepage and sub-surface flow. Any water that enters this area will be pumped via a sump pump upstream of the primary dam. The primary dam, which will be large enough to securely hold the pipe, will be sealed in 6 mm plastic sheeting. On the downstream end there will be a sandbag dam encasing the polyethylene pipe. This pipe will allow downstream passage of water flow and fish, but upstream passage is unlikely. The area that would be de-watered will be approximately 33 m long. A sediment mat will be placed downstream of the lower dam to capture any sediment that might escape. This mat would be placed across the channel (approximately 5 m in length), and would be staked securely to the existing substrate. Fish removal will need to occur prior to de-watering.

1.2.4 Stream Channel Modification

After the concrete box culvert is removed, the stream channel would require modification, including realignment, widening, and riprap installation.

The original design called for lining the artificial channel with class 1000 riprap, and approximately 1.5 m of natural substrate placed over the riprap, to prevent potential erosion and subsequent chemical contamination. All reasonable alternatives to riprap were considered, but riprap was deemed necessary to prevent destabilization of the adjacent septic drain field. Geotextile fabric would be placed beneath the riprap. The design would also incorporate four large boulders to simulate channel complexity and sinuosity. These activities would require significant channel disturbance and the use of equipment within the dry channel area. These activities would be conducted during the ODFW defined in-water work period.

The new design consists of boulder v-weirs to provide fish passage through the 7 % gradient project area. These weirs are designed to back water up to the next weir and concentrate low flows to the apex of each weir. The rock within the channel will be composed of mixture of sizes including fines and placed in lifts to enable better sealing.

1.3 Biological Information

The UWR chinook salmon evolutionarily significant unit (ESU) was listed as threatened under the ESA by NOAA Fisheries on March 24, 1999 (64 CFR 14308). The UWR steelhead ESU was listed as threatened under the ESA by NOAA Fisheries on March 25, 1999 (64 FR 14517). Biological information on UWR chinook salmon may be found in the Status Review of Chinook Salmon from Washington, Idaho, Oregon, and California (Myers *et al.* 1998) and for UWR steelhead in the Status Review of West Coast Steelhead from Washington, Idaho, Oregon, and California (Busby *et al.* 1996).

1.4 Evaluating Proposed Action

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402 (the consultation regulations). NOAA Fisheries must determine whether the action is likely to jeopardize the listed species. This analysis involves the definition of the biological requirements and current status of the listed species; and evaluation of the relevance of the environmental baseline to the species' current status.

Subsequently, NOAA Fisheries evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NOAA Fisheries must consider the estimated level of mortality attributable to: (1) Collective effects of the proposed or continuing action; (2) the environmental baseline; and (3) any cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed salmonid's life stages that occur beyond the action area. If NOAA Fisheries finds that the action is likely to jeopardize the listed species, NOAA Fisheries must identify reasonable and prudent alternatives for the action.

Furthermore, NOAA Fisheries must determine whether habitat modifications appreciably diminish both survival and recovery of the listed species. NOAA Fisheries identifies those effects of the action that impair the function of any essential element of habitat. NOAA Fisheries then considers whether such impairment appreciably diminishes the habitat's value for the species' survival and recovery.

For the proposed action, NOAA Fisheries' jeopardy analysis considers direct or indirect mortality of fish attributable to the action.

1.4.1 Biological Requirements

The first step in the methods NOAA Fisheries uses for applying the ESA section 7(a)(2) to listed salmon is to define the species' biological requirements that are most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list

UWR chinook salmon (Myers *et al*., 1998) and UWR steelhead (Busby *et al.*, 1996) for ESA protection and also considers new data available that is relevant to the determination.

The relevant biological requirements are those necessary for UWR chinook salmon and UWR steelhead to survive and recover to naturally-reproducing population levels, at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment.

For this consultation, the biological requirements are improved habitat characteristics that function to support successful migration, spawning, holding, and rearing. The current status of the UWR chinook salmon and UWR steelhead, based upon their risk of extinction, has not significantly improved since the species were listed and, in some cases, their status may have worsened. Adult UWR chinook returns to the McKenzie River have declined from highs of 10,000 - 13,000 during 1988 to 1991, to recent low levels of 3,000 - 4,000 from 1994 to1998. Of all the areas of habitat for UWR chinook salmon, the McKenzie River watershed is critical to maintaining this ESU (Oregon Department of Fish and Wildlife: January, 1999 stock status report at *www.dfw.state.or.us/ springfield /McKChs.htm*.).

1.4.2 Environmental Baseline

The current range-wide status of the identified ESU's may be found in Myers *et al.* (1998) and Busby *et al.* (1996). The identified action will occur within the range of UWR chinook salmon and UWR steelhead. The defined action area is the area that is directly and indirectly affected by the action. The direct effects occur at the project site and may extend upstream or downstream based on the potential for impairing fish passage, hydraulics, sediment and pollutant discharge, and the extent of riparian habitat modifications. Indirect affects may occur throughout the watershed where actions described in this Opinion lead to additional activities or affect ecological functions contributing to stream degradation. As such, the action area for the proposed activities include the immediate watershed where the riprap and bridge replacement will occur, and those areas upstream and downstream that may reasonably be affected, temporarily or in the long term. For the purposes of this Opinion, the action area is defined as the streambed and streambank of Bear Creek, extending upstream to the edge of disturbance, and extending downstream to the extent of visible short-term turbidity increases resulting from the project work. Other areas of the McKenzie River watershed are not expected to be directly or indirectly impacted.

UWR chinook salmon and UWR steelhead occur throughout the McKenzie River and its tributaries. Adult spring chinook salmon require deep pools within reasonable proximity to spawning areas where they hold and mature for several months between migration and spawning. Preferred spawning and rearing areas have a low gradient (generally less than 3%), but adults often ascend much higher gradient reaches to find desirable spawning areas.

The Bear Creek watershed covers just over 11 km^2 with the headwaters in the Willamette National Forest, near the town of Vida. Bear Creek flows from its headwaters 6 km to its confluence with the McKenzie River (Delorme 1998).

Bear Creek is not currently listed on the Oregon Department of Environmental Quality (ODEQ) 303(d) List of Water Quality Limited Water Bodies (ODEQ 1999).

Based on the best available information on the current status of UWR chinook salmon and UWR steelhead range-wide, the population status, trends, and genetics, and the "at risk" environmental baseline conditions within the action area, NOAA Fisheries concludes that the biological requirements of the identified ESUs within the action area are not currently being met. The following habitat indicators are either at risk or not properly functioning within the action area: Physical barriers, large woody debris, and pool frequency. Actions that do not maintain or restore properly functioning aquatic habitat conditions would be likely to jeopardize the continued existence of UWR chinook salmon and UWR steelhead.

1.5 Analysis of Effects

1.5.1 Effects of Proposed Action

The effects determination in this Opinion was made using a method for evaluating current aquatic conditions, the environmental baseline, and predicting effects of actions on them. This process is described in the document *Making ESA Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NMFS 1996). The effects of actions are expressed in terms of the expected effect (restore, maintain, or degrade), on aquatic habitat factors in the project area.

The current status of the site is at risk because of the lack of large woody debris recruitment (LWD), the lack of pool habitat, fish passage barriers, and the proximity of the highway to the river. All of these aquatic habitat factors will be maintained except for fish passage, which will be restored.

The proposed action has the potential to cause the following impacts to UWR chinook salmon or UWR steelhead or their habitat:

<u>Riprap</u>
Riprap would be installed around the perimeter of the channel in the project area, and approximately 1.5 m below natural substrate. Riprap is necessary to protect the bridge abutments and reduce the scour along the west bank, however, use of riprap has the potential to change salmonid migration and rearing behavior. These effects are expected to be long-term, but localized. The riprap would also potentially hinder localized water exchange processes (*i.e.*, hyporheic-surface water exchange) and floodplain connectivity within the small area underneath and immediately adjacent to the bridge. However, these processes are currently completely non-functioning because this area is encased in a concrete box culvert.

Riprap will be placed during the low-water season. Geotextile fabric will be placed underneath the riprap. Some larger rocks may be placed into the flowing stream, however, careful placement of large, clean boulders will minimize turbidity and other impacts to fish. The existing substrate of the area is concrete, and therefore impacts from changing the concrete substrate to subgrade riprap are assumed to be negligible.

The large rock used in the weirs and the altered channel could affect surface flow. There could potentially be subsurface flow until all of the interstitial voids are sealed within the channel and the weirs. During low flow periods this could affect fish passage through the project area. Part of the design is to use varying sizes of rock, including fines, so that as the weirs are constructed, the rock is thoroughly mixed and plated into place, filling many of the voids from the start.

This section of Bear Creek is predominately used as a migratory corridor by listed fish species. Because of the proximity to the McKenzie River, a variety of species and life stages may utilize the project reach. The removal of the box culvert and channel modification activities were scheduled so that they would occur during the Oregon Department of Fish and Wildlife (ODFW) preferred in-water work period. Upstream fish passage would not be maintained through the water diversion pipe. However, the area does not currently pass fish at times of low flow, so there would not be a change in current conditions during these activities. Post-construction, this project would establish upstream passage for both adults and juveniles. Although the resulting channel would not be in a completely natural state, it would provide velocity breaks and resting places for juvenile and adult salmonids. Because of the extent of in-water work and flow diversion associated with this project, the probability of take of ESA-listed fish associated with these actions is reasonably certain to occur.

The maple trees that would be removed are on the upstream side of the roadway and provide minimal shading due to the presence of the road surface. A 60-cm diameter cedar may also be removed because of utility relocations, however, this tree will stay on site if it is removed. The functional value of the vegetation proposed for removal is low relative to the riparian vegetation upstream and downstream of the area. The maples shade and provide organic inputs predominately to the roadway, rather than the stream. Their removal would have minimal impacts on the nutrient dynamics and thermal processes in the lower basin.

In-water Work

Any in-water work has the potential to increase erosion from the streambank, and turbidity in the river. Possible impacts to water quality could occur from construction-related debris, chemical contamination, and increased turbidity levels. Localized increases of erosion/turbidity during in-water work will likely displace UWR chinook salmon and UWR steelhead in the project area and disrupt normal behavior. These effects are expected to be temporary and localized. Water quality impacts would be minimized or avoided through the development and implementation of best management practices (BMPs) prescribed in a Bridge Removal and Construction Plan (BRCP), Pollution Control Plan (PCP), Erosion and Sediment Control Plan (ESCP), and water diversion measures. Both ODOT environmental staff and engineers would review the BRCP, PCP, and ESCP prior to work commencement to ensure the BMPs are adequate to protect fish.

Containment of the work area and other measures would prevent construction-related debris, chemicals, and excessive turbidity from contaminating the water. The water diversion measures are intended to further minimize impacts to water quality. The removal of the structure and proposed channel modifications would be conducted in the dry, thereby minimizing turbidity and opportunities for contamination. The removed debris would be placed in an approved upland site.

The existing structure directs flow, counter to the natural alignment of the stream. If the structure is removed and the channel is allowed to reestablish a natural state of equilibrium, the downstream private properties would be in danger of bank failure and erosion, including possible loss of a septic drain field.

Stormwater Runoff

Because the bridge is located directly over the stream, the stormwater runoff associated with the bridge deck would have negligible impacts on the hydrology of Bear Creek. This runoff would be a component of channel interception to the stream during a precipitation event. The effects are potential degradation of water quality, and adverse effects to Bear Creeks' hydrograph from storm water discharge. To minimize these impacts, the stormwater would be allowed to run through a vegetated ditch prior to flowing through the riparian vegetation and into the stream.

This relatively small volume of water would also have limited opportunities to adsorb roadway contaminants and chemicals prior to entering the stream because of the small bridge area and low average daily traffic (ADT) (approximately 3,700 vehicles). The chemically contaminated stormwater runoff that did make it off the edges of the roadway would then be filtered via bio-geo-chemical processes over vegetated ground prior to entering Bear Creek.

Channel Isolation

Isolation of the channel could have direct effects to ESA-listed fish during the fish removal and relocation process. During fish removal there is an increased chance for handling and direct mortality. Direct harm to fish species may occur during structure removal and construction activities. The probability of harm is less likely because these activities would be conducted during the ODFW defined in-water work period, when fish presence is less likely. During channel modification activities, passage would be blocked by the diversion and fish would be removed from the work area and relocated to an area with adequate cover and water quality.

The effects of these activities on UWR chinook salmon and UWR steelhead and aquatic habitat will be limited by implementing construction methods and approaches, included in the project design, that are intended to avoid or minimize impacts.

1.5.2 Cumulative Effects

"Cumulative effects" are defined in 50 CFR 402.02 as those effects of "future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." The action area for this consultation includes

the streambed and streambank of Bear Creek within the area of disturbance at the project site and downstream to the extent of visible short-term turbidity increases resulting from the project work. NOAA Fisheries is not aware of any specific future actions which are reasonably certain to occur on non-federal lands within the Bear Creek watershed.

1.6. Conclusion

After reviewing the current status of UWR chinook salmon and UWR steelhead, the environmental baseline for the action area, the effects of the proposed Bear Creek Bridge Replacement Project, and cumulative effects, it is the NOAA Fisheries Opinion that this project, as proposed, is not likely to jeopardize the continued existence of the UWR chinook salmon or UWR steelhead. NOAA Fisheries believes the proposed action would cause a minor, short-term adverse effects to anadromous salmonid habitat due to sediment/turbidity impacts and riprap placement. This action will maintain pool frequency and LWD levels, and will restore fish passage. This conclusion is based on findings that the proposed action will minimize death or injury to UWR chinook salmon and UWR steelhead by adhering to in-water work timing guidelines, controlling erosion and sedimentation, isolating the work area and removing fish.

1.7 Reinitiation of Consultation

This concludes formal consultation on the Bear Creek Bridge Replacement Project. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species in a manner or to an extent not considered in this Opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species not considered in this Opinion; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

2. INCIDENTAL TAKE STATEMENT

Section 9 and rules promulgated under section 4(d) of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, and sheltering. "Harass" is defined as actions that create the likelihood of injuring listed species by annoying it to such an extent as to significantly alter normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. "Incidental take" is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

2.1 Amount or Extent of Take

NOAA Fisheries anticipates that the action covered by this Opinion is reasonably certain to result in incidental take of UWR chinook salmon and UWR steelhead because of detrimental effects from increased sediment levels (non-lethal), the potential for direct incidental take during the work area isolation, and delayed mortality due to handling during the fish removal process. Effects of actions such as the placement of riprap and increased sediment levels are largely unquantifiable in the short term, and are not expected to be measurable as long-term harm to habitat features or by long-term harm to UWR chinook salmon or UWR steelhead behavior or population levels. Therefore, even though NOAA Fisheries expects some low level incidental take to occur due to the actions covered by this Opinion, the best scientific and commercial data available are not sufficient to enable NOAA Fisheries to estimate a specific amount of incidental take to the species itself. In instances such as these, NOAA Fisheries designates the expected level of take as "unquantifiable."

Based on the information in the BA, NOAA Fisheries anticipates that an unquantifiable amount of incidental take is reasonably certain to occur as a result of the actions covered by this Opinion. In addition, NOAA Fisheries expects the possibility exists for handling UWR steelhead and UWR chinook salmon during the work isolation process resulting in incidental take to individuals during the construction period. NOAA Fisheries anticipates that incidental take of up to 50 juvenile UWR steelhead and UWR chinook salmon could occur as a result of the work isolation process, due to de-watering and re-watering of the channel. The extent of the take is limited to UWR steelhead and UWR chinook salmon within the action area. The extent of the take includes the streambed and streambank of Bear Creek, extending upstream to the edge of disturbance, and downstream to the extent of visible short-term turbidity increases resulting from the project work.

2.2 Reasonable and Prudent Measures

NOAA Fisheries believes that the following reasonable and prudent measures are necessary and appropriate to minimizing take of UWR chinook salmon and UWR steelhead:

1. Minimize the amount and extent of incidental take from riprap placement activities on the streambank of Bear Creek by taking measures to limit the duration and extent of rock placement in the riparian area, and to schedule such work when the fewest number of fish are expected to be present.

2. Minimize the likelihood of incidental take from activities involving box culvert removal, bridge construction, channel alteration, use of heavy equipment, site restoration, or that may otherwise involve in-water work or affect fish passage by directing the contractor to avoid or minimize disturbance to riparian and aquatic systems.

3. Minimize the likelihood of incidental take from in-water work activities by ensuring that the in-water work activities (box culvert removal and riprap placement) are isolated from flowing water.

4. Ensure effectiveness of implementation of the reasonable and prudent measures, all erosion control measures and plantings for site restoration by evaluating and monitoring.

2.3 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the FHWA must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1. To implement Reasonable and Prudent Measure #1 (riprap placement activities), the FHWA shall require completion of the following:
   a. Rock will be individually placed in a way that produces an irregularly contoured face to provide velocity disruption. No end dumping will be allowed.
   b. Any instream large wood or riparian vegetation that is moved or altered during construction will stay on site or be replaced with a functional equivalent.
   c. The bankline and riprap will be revegetated using natural vegetation (*e.g*. willow stakes).

2. To implement Reasonable and Prudent Measure #2 (construction and channel alteration), the FHWA shall ensure that:
   a. Project design. Alteration or disturbance of the stream banks and existing riparian vegetation will be minimized.

b. Timing of in-water work. Work within the active channel will be completed during the ODFW (2000) preferred in-water work period[1], as appropriate for the project area, unless otherwise concurred to in writing by NOAA Fisheries.

c. Cessation of work. Project operations will cease under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.

d. Fish screens. All water intakes used for a project, including pumps used to isolate an in-water work area, will have a fish screen installed, operated and maintained according to NOAA Fisheries' fish screen criteria.[2]

e. Fish passage. Passage will be provided for any adult or juvenile salmonid species present in the project area during construction, and after construction for the life of the project. Upstream passage is not required during construction if it did not previously exist.

f. Pollution and Erosion Control Plan. A Pollution and Erosion Control Plan will be prepared and carried out to prevent pollution related to construction operations. The plan must be available for inspection on request by NOAA Fisheries.

    i. Plan Contents. The Pollution and Erosion Control Plan must contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations:

        a. Practices to prevent erosion and sedimentation associated with access roads, stream crossings, construction sites, borrow pit operations, haul roads, equipment and material storage sites, fueling operations and staging areas.

        b. Practices to confine, remove and dispose of excess concrete, cement and other mortars or bonding agents, including measures for washout facilities.

        c. A description of any hazardous products or materials that will be used for the project, including procedures for inventory, storage, handling, and monitoring.

        d. A spill containment and control plan with notification procedures, specific clean up and disposal instructions for different products, quick response containment and clean up measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.

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[1] Oregon Department of Fish and Wildlife, *Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources*, 12 pp (June 2000) (identifying work periods with the least impact on fish) (http://www.dfw.state.or.us/ODFWhtml/InfoCntrHbt/0600_inwtrguide.pdf)

[2] National Marine Fisheries Service, *Juvenile Fish Screen Criteria* (revised February 16, 1995) and *Addendum: Juvenile Fish Screen Criteria for Pump Intakes* (May 9, 1996) (guidelines and criteria for migrant fish passage facilities, and new pump intakes and existing inadequate pump intake screens) (http://www.nwr.noaa.gov/1hydrop/hydroweb/ferc.htm).

e. Practices to prevent construction debris from dropping into any stream or water body, and to remove any material that does drop with a minimum disturbance to the streambed and water quality.

ii. Inspection of erosion controls. During construction, all erosion controls must be inspected daily during the rainy season and weekly during the dry season to ensure they are working adequately.[3]

a. If inspection shows that the erosion controls are ineffective, work crews must be mobilized immediately to make repairs, install replacements, or install additional controls as necessary.

b. Sediment must be removed from erosion controls once it has reached 1/3 of the exposed height of the control.

g. Preconstruction activity. Before significant[4] alteration of the project area, the following actions must be completed.

i. Marking. Flag the boundaries of clearing limits associated with site access and construction to prevent ground disturbance of critical riparian vegetation, wetlands and other sensitive sites beyond the flagged boundary.

ii. Emergency erosion controls. Ensure that the following materials for emergency erosion control are onsite:

a. A supply of sediment control materials (*e.g.*, silt fence, straw bales[5]).

b. An oil-absorbing floating boom whenever surface water is present.

iii. Temporary erosion controls. All temporary erosion controls must be in-place and appropriately installed downslope of project activity within the riparian area until site restoration is complete.

h. Earthwork. Earthwork (including drilling, excavation, dredging, filling and compacting) will be completed as quickly as possible.

i. Site stabilization. All disturbed areas must be stabilized, including obliteration of temporary roads, within 12 hours of any break in work unless construction will resume work within 7 days between June 1 and September 30, or within 2 days between October 1 and May 31.

ii. Source of materials. Boulders, rock, woody materials and other natural construction materials used for the project must be obtained outside the riparian area.

i. Heavy Equipment. Use of heavy equipment will be restricted as follows:

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[3] "Working adequately" means no turbidity plumes are evident during any part of the year.

[4] "Significant" means an effect can be meaningfully measured, detected or evaluated.

[5] When available, certified weed-free straw or hay bales must be used to prevent introduction of noxious weeds.

i. Choice of equipment. When heavy equipment must be used, the equipment selected must have the least adverse effects on the environment (*e.g.*, minimally sized, rubber-tired).

ii. Vehicle staging. Vehicles must be fueled, operated, maintained and stored as follows:

a. Vehicle staging, cleaning, maintenance, refueling, and fuel storage must take place in a vehicle staging area placed 150 feet or more from any stream, water body or wetland.

b. All vehicles operated within 150 feet of any stream, water body or wetland must be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected must be repaired in the vehicle staging area before the vehicle resumes operation. Inspections must be documented in a record that is available for review on request or NOAA Fisheries.

c. All equipment operated instream must be cleaned before beginning operations below the bankfull elevation to remove all external oil, grease, dirt, and mud.

iii. Stationary power equipment. Stationary power equipment (*e.g.*, generators, cranes) operated within 150 feet of any stream, water body or wetland must be diapered to prevent leaks, unless otherwise approved in writing by NOAA Fisheries.

j.. Site restoration. All streambanks, soils and vegetation disturbed by the project are cleaned up and restored as follows:

i. Restoration goal. The goal of site restoration is renewal of habitat access, water quality, production of habitat elements (such as large woody debris), channel conditions, flows, watershed conditions and other ecosystem processes that form and maintain productive fish habitats.

ii. Streambank shaping. Damaged streambanks must be restored to a natural slope, pattern and profile suitable for establishment of permanent woody vegetation.

iii. Revegetation. Areas requiring revegetation must be replanted before the first April 15 following construction with a diverse assemblage of species that are native to the project area or region, including grasses, forbs, shrubs and trees. Riprap areas will be planted with willows on 3-foot centers.

iv. Pesticides. No pesticide application is allowed, although mechanical or other methods may be used to control weeds and unwanted vegetation.

v. Fertilizer. No surface application of fertilizer may occur within 50 feet of any stream channel.

k.. Weir and stream channel design. The stream channel should be constructed in a way that will provide fish passage.

i. Rock used in the channel should be of various sizes including fine material to help enable sealing the substrate and the weirs.

ii. Material should be mixed and plated into place. There should be no rock stratification by size (no layering).
iii. A step pool profile shall be created, with steps placed at 1 to 4 channel widths apart and 0.8 ft max drops.
iv. Adequate depth should exist below each weir to enable fish the room to negotiate the weirs. This depth will also benefit energy dissipation.
v. The design of each weir must concentrate flow into the center of the downstream pool. This concentration is accomplished by providing a slight elevation decrease from each bank to the center.
vi. Below each weir adequate space should be left unarmored for pool depth.

3. To implement Reasonable and Prudent Measure #3, the FHWA shall ensure that the in-water work activities (box culvert removal, channel alteration, and riprap placement), are isolated from flowing water.
   a. If the fish salvaging aspect of this project requires the use of seine equipment to capture fish, it must be accomplished as follows:
      i. Before and intermittently during pumping, attempts will be made to seine and release fish from the work isolation area as is prudent to minimize risk of injury.
      ii. Seining will be conducted by, or under the supervision of a fishery biologist experienced in such efforts. Staff working with the seining operation must have the necessary knowledge, skills, and abilities to ensure the safe handling of all ESA-listed fish.
      iii. ESA-listed fish must be handled with extreme care and kept in water to the maximum extent possible during seining and transfer procedures. The transfer of ESA-listed fish must be conducted using a sanctuary net that holds water during transfer, whenever appropriate, to prevent the added stress of an out-of-water transfer.
      iv. Seined fish must be released as near as possible to capture sites.
      v. The FHWA shall ensure that the transfer of any ESA-listed fish to third parties other than NOAA Fisheries personnel receives prior approval from NOAA Fisheries.
      vi. The FHWA shall ensure that any other Federal, state, and local permits and authorizations necessary for the conduct of the seining activities will be obtained prior to project seining activity.
      vii. The FHWA must allow NOAA Fisheries or its designated representative to accompany field personnel during the seining activity, and allow such representative to inspect the seining records and facilities.
      viii. A description of any seine and release effort will be included in a post-project report, including the name and address of the supervisory fishery biologist, methods used to isolate the work area and minimize disturbances to ESA-listed species, stream conditions before and following placement and removal of barriers, the means of fish removal,

the number of fish removed by species, the condition of all fish released, and any incidence of observed injury or mortality.

b. If the fish salvaging aspect of this project requires the use of electrofishing equipment to capture fish, it must be accomplished as follows (NMFS 2000):

i. Electrofishing may not occur near listed adults in spawning condition or near redds containing eggs.

ii. Equipment must be in good working condition. Operators must go through the manufacturer's preseason checks, follow all provisions, and record major maintenance work in a log.

iii. A crew leader having at least 100 hours of electrofishing experience in the field using similar equipment must train the crew. The crew leader's experience must be documented and available for confirmation; such documentation may be a logbook. The training must occur before an inexperienced crew begins any electrofishing; it must also be conducted in waters that do not contain listed fish.

iv. Measure conductivity and set voltage as follows:

	Conductivity (umhos/cm)	Voltage
a.	Less than 100	900 to 1100
b.	100 to 300	500 to 800
c.	Greater than 300	150 to 400

v. Direct current (DC) must be used at all times.

vi. Each session must begin with pulse width and rate set to the minimum needed to capture fish. These settings should be gradually increased only to the point where fish are immobilized and captured. Start with pulse width of 500 us and do not exceed 5 milliseconds. Pulse rate should start at 30Hz and work carefully upwards. In general, pulse rate should not exceed 40 Hz, to avoid unnecessary injury to the fish.

vii. The zone of potential fish injury is 0.5 m from the anode. Care should be taken in shallow waters, undercut banks, or where fish can be concentrated because in such areas the fish are more likely to come into close contact with the anode.

viii. The monitoring area must be worked systematically, moving the anode continuously in a herringbone pattern through the water. Do not electrofish one area for an extended period.

ix. Crew members must carefully observe the condition of the sampled fish. Dark bands on the body and longer recovery times are signs of injury or handling stress. When such signs are noted, the settings for the electrofishing unit may need adjusting. Sampling must be terminated if injuries occur or abnormally long recovery times persist.

x. Whenever possible, a block net must be placed below the area being sampled to capture stunned fish that may drift downstream.

xi. The electrofishing settings must be recorded in a logbook along with conductivity, temperature, and other variables affecting efficiency. These

notes, with observations on fish condition, will improve technique and form the basis for training new operators.

c. After completion of the project the existing channel should be re-watered in a way that will not significantly impact water quality or cause fish stranding.

i. Maintain the diversion pipe in place while slowly dismantling the upper and lower dams. This will allow the new channel to slowly water-up, while still maintaining flow in the lower channel below the project. Because the area above the upper dam has temporarily expanded usable habitat for fish, slowly ramping the water will allow fish to get back into the actual low-flow channel. A biologist shall be on site to monitor for fish stranding during this process.

4. To implement Reasonable and Prudent Measure #4 (monitoring and reporting), the FHWA shall ensure that:

a. Implementation monitoring. Ensure that ODOT submits a monitoring report to the NOAA Fisheries within 120 days of project completion describing success meeting these terms and conditions. The monitoring report will include the following information.

i. Project identification

a. Permittee name, consultation number, and project name.
b. Type of activity
c. Project location
d. FHWA contact person.
e. Starting and ending dates for work completed

ii. Narrative assessment. A narrative assessment of the project's effects on natural stream function.

iii. Photo documentation. Photo of habitat conditions at the project and any compensation site(s), before, during, and after project completion.[6]

a. Include general views and close-ups showing details of the project and project area, including pre and post construction.
b. Label each photo with date, time, project name, photographer's name, and a comment about the subject.

iv. Other data. Additional project-specific data, as appropriate for individual projects.

a. Work cessation. Dates work cessation was required due to high flows.
b. Fish screen. Compliance with NOAA Fisheries' fish screen criteria.

[6] Relevant habitat conditions may include characteristics of channels, eroding and stable streambanks in the project area, riparian vegetation, water quality, flows at base, bankfull and over-bankfull stages, and other visually discernable environmental conditions at the project area, and upstream and downstream of the project.

c. A summary of pollution and erosion control inspections, including any erosion control failure, hazardous material spill, and correction effort.

d. Site preparation.
   i. Total cleared area – riparian and upland.
   ii. Total new impervious area.

e. Isolation of in-water work area, capture and release.
   i. Supervisory fish biologist – name and address.
   ii. Methods of work area isolation and take minimization.
   iii. Stream conditions before, during and within one week after completion of work area isolation.
   iv. Means of fish capture.
   v. Number of fish captured by species.
   vi. Location and condition of all fish released.
   vii. Any incidence of observed injury or mortality.

f. Site restoration.
   i. Finished grade slopes and elevations.
   ii. Log and rock structure elevations, orientation, and anchoring (if any).
   iii. Planting composition and density.

b. On an annual basis, for 5 years after completing the project, the FHWA shall ensure submital of a monitoring report to NOAA Fisheries describing the FHWA's success in meeting their habitat restoration goals through project onsite restoration activities and through compensatory mitigation. This report will consist of the following information.

a. Project identification.
   a. Project name,
   b. starting and ending dates of work completed for this project, and
   c. the FHWA contact person.

b. Site and channel relocation restoration. Documentation of the following conditions:
   a. Any changes in rock structure elevations, orientation, and anchoring.
   b. Any changes in planting composition and density.
   c. A plan to inspect and, if necessary, replace failed plantings and structures, including the compensatory mitigation site.

c. Photographic documentation of environmental conditions at the project site after project completion.

d. Profile and cross sections must be surveyed annually. Bed material should be measured and compared to the design mix annually. Assessment of passage through the project should be done annually by a qualified biologist or engineer.

c. If a dead, injured, or sick endangered or threatened species specimen is located, initial notification must be made to the NOAA Fisheries Law Enforcement Office,

located at Vancouver Field Office, 600 Maritime, Suite 130, Vancouver, Washington 98661; phone: 360/418-4246. Care will be taken in handling sick or injured specimens to ensure effective treatment and care or the handling of dead specimens to preserve biological material in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered and threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

Oregon Habitat Branch Chief - Portland
NOAA Fisheries
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3. MAGNUSON-STEVENS ACT

3.1 Background

The objective of the essential fish habitat (EFH) consultation is to determine whether the proposed actions may adversely affect designated EFH for relevant species, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH resulting from the proposed action.

3.2 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires the inclusion of EFH descriptions in Federal fishery management plans. In addition, the MSA requires Federal agencies to consult with NOAA Fisheries on activities that may adversely affect EFH.

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting the definition of essential fish habitat: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.110).

Section 305(b) of the MSA (16 U.S.C. 1855(b)) requires that:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH;
- NOAA Fisheries shall provide conservation recommendations for any Federal or state activity that may adversely affect EFH;
- Federal agencies shall within 30 days after receiving conservation recommendations from NOAA Fisheries provide a detailed response in writing to NOAA Fisheries regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NOAA Fisheries, the Federal agency shall explain its reasons for not following the recommendations.

The MSA requires consultation for all actions that may adversely affect EFH, and does not distinguish between actions within EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NOAA Fisheries is required by Federal agencies undertaking, permitting or funding activities that may adversely affect EFH, regardless of its location.

3.3 Identification of EFH

The Pacific Fisheries Management Council (PFMC) has designated EFH for Federally-managed fisheries within the waters of Washington, Oregon, and California. Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years) (PFMC 1999).

Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of the potential adverse effects to these species' EFH from the proposed action is based on this information.

The Pacific Fisheries Management Council (PFMC) has designated EFH for three species of Pacific salmon: Chinook (*Oncorhynchus tshawytscha*); coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based on this information.

3.4 Proposed Action

The proposed action is detailed above in section 1.2. The action area for this consultation includes the streambed and streambank of Bear Creek within the area of disturbance at the project site and downstream to the extent of visible short-term turbidity increases resulting from the project work. This area has been designated as EFH for chinook salmon.

3.5 Effects of Proposed Action

Spring chinook salmon spawn downstream of the confluence of Bear Creek and the McKenzie River, but due to the lack of spawning habitat in Bear Creek, they primarily use it for rearing as juveniles. This project will open up 1 km of spawning and rearing habitat. As described in detail in Section 1.5 of this Opinion, the proposed action may result in short term adverse effects to water quality (sediment, chemical contamination). NOAA Fisheries believes the implementation of the bridge replacement project is likely to adversely affect EFH for chinook salmon. NOAA Fisheries also believes that providing fish passage and the conservation measures proposed as an integral part of the action would avoid, minimize, or otherwise offset potential adverse impacts to designated EFH.

3.6 Conclusion

NOAA Fisheries believes that implementation of the bridge replacement project in Bear Creek is likely to adversely affect designated EFH for chinook salmon.

3.7 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the Magnuson-Stevens Act, NOAA Fisheries is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. The conservation measures proposed for the project by the FHWA, all of the reasonable and prudent measures and the terms and conditions contained in section 2.3 are applicable to chinook salmon EFH. Therefore, NOAA Fisheries incorporates each of those measures here as EFH recommendations.

3.8 Statutory Response Requirement

Please note that the Magnuson-Stevens Act (section 305(b)) and 50 CFR 600.920(j) requires the Federal agency to provide a written response to NOAA Fisheries after receiving EFH conservation recommendations within 30 days of its receipt of this letter. This response must include a description of measures proposed by the agency to avoid, minimize, mitigate or offset the adverse impacts of the activity on EFH. If the response is inconsistent with a conservation recommendation from NOAA Fisheries, the agency must explain its reasons for not following the recommendation.

3.9 Supplemental Consultation

The FHWA must reinitiate EFH consultation with NOAA Fisheries if either the action is substantially revised or new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920).

4. LITERATURE CITED

Section 7(a)(2) of the ESA requires biological opinions to be based on "the best scientific and commercial data available." This section identifies the data used in developing this Opinion.

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